

US EPA ARCHIVE DOCUMENT

Analysis for Organophosphorus Pesticides and Oxygen Analogs During Agricultural Spraying and Implications Regarding Proper Exposure Assessment of Migrant Worker Communities in Yakima Valley, WA

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Background: Agricultural spray applications pose a number of health risks to nearby migrant worker communities through off-target movement of pesticides in Yakima Valley, WA. This presentation will focus on a range of sub-study results investigating the root cause of unexpectedly high levels of the more potent chlorpyrifos oxon in air samples during a 2008 air monitoring study conducted for the Washington State Department of Health Pesticide Program.

Methods: Samples were analyzed for chlorpyrifos and its oxon using LC-MS-MS.

Results: During the sampling process in laboratory and field settings, researchers identified an artificial transformation from the parent chlorpyrifos to oxon metabolite in the National Institute of Occupational Safety and Health (NIOSH)-recommended OVS sampling tubes when comparing to other sampling methods. These results highlight the potential underestimation of pesticide concentrations if chemical analysis for the oxon metabolite is not included.

Conclusion: Further studies will be needed to model this interaction, investigate alternative sampling methods, and reconstruct past pesticide exposure estimations using the OVS tubes. The development of refined sample methods will notably impact current pesticide exposure assessment, particularly for susceptible individuals, migrant workers, and their families.

Research funded by a NIOSH pilot ERC grant.